Atkinson as a Teacher of Physics, for the purposes of medical education.

The honorary degree of M.A. is proposed to be conferred on Mr. A. Graham, First Assistant at the Observatory, in recognition of his astronomical services.

Mr. M. C. Potter of Peterhouse has been appointed Assistant Curator of the Herbarium.

Mr. W. H. Caldwell, Fellow of Caius College, has been appointed the first Balfour student.

At St. John's College, in December, there will be open for competition among students who have not commenced residence in the University—The Foundation Scholarships then vacant, two of which may, after residence is commenced, be increased in value to 100*l.* a year on condition of regular residence, satisfactory progress, and good conduct; four Minor Scholarships, two being of the value of 75*l.* a year and two of 50*l.* a year; three Exhibitions of 50*l.* a year for two years; one Exhibition of 40*l.* a year for four years; one Exhibition of 32*l.* a year for four years; together with two Exhibitions of 30*l.* a year for four years; one Exhibition of 33*l.* 6*s.* 8*d.* a year for three years. The number of Exhibitions may be increased if candidates of sufficient merit present themselves. The Foundation Scholarships and Minor Scholarships are open to candidates under nineteen years of age. The Minor Scholarships are tenable for two years, or until the Minor Scholar is elected to a Foundation Scholarship. The Exhibitions are open to all candidates irrespective of age, and are not vacated by the election of the Exhibitioner to a Foundation Scholarship. The number of Foundation Scholarships is sixty. Candidates may present themselves for examination in any of the following subjects, namely, Classics, Mathematics, Natural Science, Hebrew, and Sanskrit. A candidate may be elected on the ground of proficiency in any one of these taken singly. The Examination in Natural Science will include papers and practical work in Physics, Chemistry, General Biology, Botany, Zoology and Comparative Anatomy, Human Anatomy, Physiology, and Geology. Every candidate must show a competent knowledge of two at least of the following subjects, namely: (1) Elementary Physics, (2) Elementary Chemistry, (3) Elementary Biology [the range of the examination in Elementary Biology may be taken as defined by the contents of Huxley and Martin's "Course of Practical Instruction in Elementary Biology" (Macmillan)]. A candidate may be elected on the ground of special proficiency in any one of the foregoing sciences. Each candidate's name should be sent not later than November 27, 1883, to the tutor under whom it is proposed to place him.

SCIENTIFIC SERIALS

THE *Journal of Physiology*, vol. iv. Nos. 2 and 3, August, 1883, contains: W. H. Gaskell, on the innervation of the heart, with special reference to the heart of the tortoise (plates 2 to 5).—J. Th. Cash, description of a double cardiograph for the frog's heart.—Wesley T. Mills, an examination of some controverted points of the physiology of the voice, especially the registers of the singing voice and the falsetto.—F. Warner, a method and apparatus for obtaining graphic records of various kinds of movements of the hand and its parts, and of enumerating such movements and their combinations (plate 6).—H. H. Donaldson and L. T. Stevens, the influence of digitaline on the work of the heart and on the flow through the blood-vessels.—G. F. Yeo and Th. Cash, on the relation between the active phases of contraction and the latent period of skeletal muscle.—S. Ringer, a third contribution regarding the influence of the inorganic constituents of the blood on the ventricular contraction.—L. C. Wooldridge, further observations on the coagulation of the blood.—Also Supplement Part to vol. iv. Physiological papers of 1882.

THE *Journal of the Royal Microscopical Society*, October, 1883, contains: On *Asplanchna ebbesbornii*, nov. sp., by E. T. Hudson, LL.D. (plates 9 and 10), with the usual bimonthly summary of current researches relating to zoology and botany (principally Invertebrata and Cryptogamia), microscopy, &c.

THE *American Naturalist* for October, 1883, contains: Man's place in nature, by W. N. Lockington.—The Naturalist Brazilian Expedition (No. 2, continued), the Lower Jacuhy and São Jeronymo, by H. H. Smith.—On the shells of the Colorado desert and the region further east, by R. E. Stearns (woodcuts).—Review of Report C_4 second geological survey of Pennsylvania, by Dr. P. Frazer.—Means of plant dispersion, by E. J. Hill.—Is the group Arthropoda a valid one? by J. S. Kingsley.—On the Serpentine of Staten Island, New York, and on a classification of the natural sciences, by T. Sterry Hunt.

Proceedings of the Linnean Society of New South Wales, vol. vii. part 4, 1883, contains:—E. P. Ramsay, on new species of Solea; contributions to Australian Oology, part 2; notes on birds from Solomon Islands.—E. Meyrick, Australian Microlepidoptera, Oecophoridæ.—Prof. Stephens, geology of the Western coalfields, parts 1 and 2.—Dr. J. C. Cox, edible Australian oysters.—C. W. de Vis, new birds of Queensland; description of a new Belideus from Northern Queensland; on two new Queensland fishes.—Rev. C. Kalchbrenner, *Fungi aliquot Australiæ Orientalis*, and on new species of Agaricus.—Rev. J. E. Tenison-Woods, botanical notes on Queensland; on a species of Brachyphyllum from mesozoic coal beds, Ipswich, Queensland.—Wm. Macleay, new fishes of New Guinea, No. 3.—Wm. A. Haswell, on *Phoronis australis*, n.sp.; an instance of symbiosis (an Actinia lodging in the pits of a species of Cellepora); segmental organs of Aphroditea.—On some new species of Australian tubicolous annelids (plate).—E. Haviland, plants indigenous to Sydney.—Rev. Dr. Woolls, Eucalypts first known in Europe.—J. J. Fletcher, comparative anatomy of the female urogenital system in kangaroos, part 1.—Dr. H. B. Guppy, habits of the Birgus of the Solomon Islands.

Vol. viii. part 1, June 19, 1883, contains:—William Macleay, a new form of mullet from New Guinea.—J. J. Fletcher, anatomy of the urogenital system of the kangaroos, part 2.—C. W. de Vis, extinct marsupial remains.—C. P. Ramsay, contributions to the zoology of New Guinea (plate, *Hapalotes papuanus*).—Some new Australian fishes.—H. R. Whittell, habits of *Pelopœus lætus*, and *Larrada australis*; on the voracity of a species of Heterostema.—Rev. J. E. Tenison-Woods, on the coal flora of Australia (eleven plates, heliotypes); gives a history of the subject and descriptive list of fossils (pp. 36-167).—Rev. B. Scortechini, contributions to the flora of Queensland.—Rev. C. Kalchbrenner, two new fungi.—Jas. Norton, fructification of the Bunya (*Araucaria bidwellii*) in Queensland.

Vol. viii. part 2, July 17, 1883, contains:—E. Haviland, plants indigenous to Sydney, Nos. 3 and 4.—C. W. de Vis, tooth-marked bones of extinct marsupials; on *Brachalletes palmeri*, an extinct marsupial; on a lower jaw of *Palorchestes azael;* on some new genera and species of Australian fishes.—H. K. Bennett, habits of *Leipoa ocellata;* on water from Eucalypti roots.—Wm. Macleay, fishes from the Burdekin and Mary Rivers; New Guinea fishes, No. 4.—J. J. Fletcher, on a viviparous lizard (*Hinulia elegans*).—John Brazier, synonymy of Australian and Polynesian land and marine mollusca; localities of some species of recent Polynesian mollusca.—Rev. J. E. Tenison-Woods, mesozoic fossils from Central Australia (two plates).—Rev. B. Scortechini, second half century of plants new to South Queensland.

Revue Internationale des Sciences Biologiques for July, 1883, contains:—Elie Reclus, studies on indigenous people: the Khonds.—Prof. Huxley, living organisms and the way to study them (translated).—Proceedings of the Academy of Sciences, Paris.

August.—Leon Metchnikov, essay on the Christian communion: the God of Nyssa and the God of Nazareth.—Prof. Huxley, living organisms and the way to study them (translated).—Proceedings of the Academy of Sciences, Amsterdam, and of the Academy of Sciences, Paris.

September.—Prof. Huxley, living organisms and the way to study them (translated).—Prof. Williamson, the primitive ancestors of living plants and their relation to the doctrine of evolution.—Proceedings of the Academy of Sciences, Paris.

Atti of the Royal Academy dei Lincei, June 17.—Remarks on Schiff's memoir on changes of volume during fusion, by Sig. Camizzaro.—On De Stefani's upper crest of the Apennines, by S. Capellini and Taramelli.—On the temperature corresponding with the glacial period, by S. Pietro Blaserna.—On the measurement of altitudes by means of the barometer, by S. Paolo Busin.—On the isobarometric types of Italy, by the same author.—On the first phenomena in the development of the embryo of the Böops (*Salpa maxima*), by S. Francesco Todaro.—On the caloric developed in liquids by the

discharge of electric condensers, by S. Emilio Villari.—Report on the antiquities recently discovered in Val della Torre, Adria, Forli, Orvieto, and other parts of Italy, by S. Fiorelli.

SOCIETIES AND ACADEMIES

PARIS

Academy of Sciences, October 29.—M. Blanchard, president, in the chair.—Allusion was made by the President to the loss sustained by the Academy in the person of M. Louis Breguet, the mechanician, who died suddenly on the night of October 26.—Observations on the geometrical deformations produced by pressure on a rectangular parallelopipedon with prolongation in a single direction (two illustrations), by M. Tresca.—Fossil and savage man; anthropological studies, by M. de Quatrefages. In presenting this important work to the Academy, the author remarked that since the discoveries of Boucher de Perthes and the jawbone of Moulin-Quignon some twenty years ago, not only has the existence of Quaternary man been universally recognised, but a certain number of distinct Quaternary races has already been determined. The existence of Tertiary man also, without being yet fully demonstrated, has been rendered highly probable, especially by the researches of M. Capellini. A detailed account is given of all the known Quaternary races of Western Europe, based mainly on the fossil remains collected by M. de Baye in the artificial caves explored by him in the department of La Marne.—Note on the freezing point of alcoholic solutions, by M. F. M. Raoult. In accordance with the general law established by the author, the soluble bases are shown to belong to two distinct groups, one presenting a molecular lowering of the freezing point comprised between 33° and 48°, with a mean of 39°; the other lying between 16° and 20°, with a mean of 19°.—Report on the results of the treatment of the vines attacked by phylloxera in the Maritime Alps, by M. Laugier. The report speaks favourably of the experiments made during the years 1881-83 with sulphuret of carbon and sulphocarbonate of potassium.—On certain equations connected with surfaces of constant curvature, by M. G. Darboux.—Determination of the equivalent of nickel by means of its sulphate, by M. H. Daubigny.—On a process for detecting by chemical analysis the traces of blood in clothes that have been washed, by M. C. Husson.—A comparative study of the excitability of the surface and deeper parts of the brain, by M. Couty.—On the spermatogenesis of podophthalmous crustaceans, and especially of the decapods, by M. G. Herrmann.—Note on the anatomy and physiology of the Sacculine and the allied genera Peltogaster and Lernæodiscus, by M. Yves Delage.

BERLIN

Physical Society, October 19.—Dr. Frölich made a report on measurements of solar heat executed by him in continuation of observations he had made at an earlier date, according to the method he was still pursuing, on the temperature of celestial space. Observations on the temperature of the earth's surface had led him to the conviction that solar heat, the principal source of the temperature of the earth, must pass through very rapid oscillations, which were in all probability connected with the quick movements on the solar surface that had been brought to light by the new methods of investigation. To establish these variations beyond all doubt required long-continued observations of the sun's heat by means of trustworthy instruments remaining invariable for years. Thermoelectric piles provided with due protective apparatus could alone be deemed instruments of this description. Mr. Langley's bolometer was not adequate for any length of time, the electric resistance of thin metal plates being liable to very rapid variations. The thermoelectric pile he had made use of was inclosed in a wide, double-walled pipe, opening in front in the shape of a funnel, in which circulated a constant stream of water of atmospheric temperature. The exposed front end of the thermopile was closed by a plate of rock salt, and the whole was set up in such a manner that it could turn in a frame, which itself might be turned in all directions and closed by means of a Venetian shutter. The whole apparatus was capable of revolving in all directions. The thermopile and the galvanometer of Siemens and Halske's recent construction were perfectly trustworthy instruments, as Dr. Frölich had repeatedly convinced himself. There now remained the task of finding a standard for the solar heat. For this purpose preparatory experiments were instituted with luminous heat generators—a glowing platina sheet and an electrical glow-lamp of older construction. These experiments, however, came to nothing. At last recourse was had to dark heat, such as was produced from a hollow screen filled with steam, one side of which is blackened with smoke, and the other whitened with chalk. With these apparatus measurements of solar heat were taken on perfectly clear days under a bright sun at very different points of the sun's altitude, and were represented by curves, the abscissæ of which showed the thickness of the transmitted atmosphere; the ordinates, the observed warmth of the sun. Under favourable conditions the curve formed a straight line, which, when extended to zero of the abscissa, furnished the measurement of the solar heat without atmospheric absorption. The measurements were at first attempted to be taken at the Berlin Observatory, but were found to present so many irregularities and oscillations in consequence of the situation of the Observatory in the midst of the city and the constantly vaporous and dusty state of the atmosphere surrounding it that they had to be discontinued there. Better and more regular results were obtained from observations made at a house in the western suburbs. The best and most conclusive measurements, however, in which the errors of observation were reduced to 1 per cent., were obtained from a tower in the West End near Berlin, where, throughout six days of the past summer, curves were registered approximating very closely to a straight line. One single measurement executed on the Faulhorn at a height of 9000 feet yielded a perfectly straight curve. The six measurements distributed over the months of June, July, August, September, and October, showed considerably different results in the different months. Dr. Frölich caused Dr. Lohse, who had been taking daily photographs of the sun at the Potsdam Observatory, to supply him with data regarding the presence of sunspots in the last months. From these data Dr. Frölich found that the lower degrees of solar heat corresponded with numerous formations of spots, while the higher gradations of heat were attended with fewer sunspots. In this coincidence Dr. Frölich was disposed to see a sequence of cause and effect. It would be necessary, however, to accumulate a large number of observations, and in particular to take them at elevated stations before any definitive judgment could be passed respecting the influence of sunspots on solar heat.

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